

## EQUIPMENT WASHER

### Cross Reference to Related Application

5           This application is a Continuation-in-Part of United States Continuation-in-Part  
Patent Application No. 10/098,466 filed March 18, 2002 which is a Continuation-in-Part of  
United States Patent Application No. 09/376,319 filed August 18, 1999, which issued April  
23, 2002 as United States Patent No. 6,374,644 which claim priority from United States  
Provisional Patent Application No. 60/096,841 filed August 18, 1998 entitled Equipment  
10 Washer.

### Field of the Invention

          This invention relates to the field of devices for washing clothing or other  
15 flexible or semi-rigid articles.

### Background of the Invention

          Anyone who has played sports, or lived with a person who plays sports such as  
20 football or hockey or like sports requiring the wearing of protective armour such as helmets,  
boots, shoulder pads and the like, is aware that, although the manufacturer of the equipment  
likely allows for the washing of such equipment, such equipment is only infrequently washed  
by hand due to the bulky nature of the pieces of equipment and hard armour which make using  
a conventional residential washing machine or Laundromat washing machine tedious, difficult  
25 and in some cases impossible. Further, in some instances sports apparel, such as ballerina's  
shoes, cannot be washed in conventional washing machines due to the nature of the apparel,  
for example, due to fragility of the material, or otherwise. Other flexible articles such as  
harnesses for lifting bed-ridden invalids often become soiled and require washing. Due to  
their construction washing of such harnesses has in the past been done by hand. Reference

herein to equipment is intended to encompass sports equipment, harnesses, other forms of protective gear or clothing. All of which share the same problem: they are cumbersome or difficult to wash and dry, for example without balling of the equipment which is flexible, especially that having hook and loop fasteners, or without damage to equipment having a hard  
5 shell and padded liners.

It is therefore an object of the present invention to provide a device and in a preferred embodiment a cooperating mesh bag, or air and liquid porous container, or the like, into which equipment, for example most if not all of a flexible sports apparel equipment outfit,  
10 and protective gear may be placed therein and subsequently removably secured within the generally cylindrically shaped washing cage or basket of a washing machine, wherein the cage or basket is selectively closable and, once closed, agitatable within a water tight enclosure such as a washing machine tub. Specifically, it is an object to hold the articles of equipment to be washed fixed in the cage or basket, and to move the entire cage or basket relative to the  
15 enclosure to obtain the flushing of water in and around the articles.

Further, it is an object of the present invention to provide a device and in a preferred embodiment a cooperating mesh bag, or otherwise air and liquid porous container, or the like, into which flexible sports apparel equipment outfit, and protective gear may be  
20 removably positioned within the generally cylindrically shaped cage or basket of a washing machine tub where the mesh container has rigid, generally rectangular perimeter stiffeners pivotally hinged together along one common edge thereof. The mesh bag is securely fastened to the stiffeners. The stiffeners are designed to reflect the dimensions of the generally cylindrically shaped cage or basket of a washing machine so that the container may be nested  
25 in a generally vertical aspect within the washing machine basket and not protrude beyond the level of the opening of the basket and when spread apart about the hinge will be brought into contact with the vertical inner surface of the washing machine basket so as to engage retainers which retain the container in the basket.

The mesh bag when constructed from a flexible fabric, may in one instance, have a perimeter frame which rigidly supports opposed generally rectangular first sides of the mesh bag in a predetermined angular separation and second sides of the bag in a curve of predetermined radius so as to conformally fit within the cylindrical basket. Alternatively, the mesh bag may be constructed from rigid material having a suitable configuration conforming to the diameter of the interior surface of the washing machine basket.

The interior surface of the washing machine basket may be provided with either longitudinal clips, channels or partitions which serve as the retainers, positioned generally parallel to the axis of rotation about which the washing machine cage or basket is agitated. The retainers, again, cooperate with the stiffeners to secure the mesh bag within the basket during the operation of the washing machine. Alternatively the interior of the washing machine cage or basket may be suitably partitioned so as to removably secure one or more garment retaining mesh bags.

#### Summary of the Invention

In summary, the washing machine of the present invention includes a frame, a tub rigidly mounted to the frame, and a basket rotatably mounted inside the tub. The basket is advantageously also air and water porous. The basket and/or tub may have at least one air and water porous equipment container is removably mountable into the basket, a releasably closable lid. The equipment container or containers may be rigid sided or flexible sides, such as a mesh bag. The basket is adapted for holding the mesh bag, or other air and liquid porous container, into which flexible articles of apparel or other equipment or protective gear may be positioned and releasably mounted substantially stationary relative to the basket as the basket is rotated relative to the tub. A water supply cooperates with the tub and basket for washing and rinsing the articles held in the basket while being rotated or agitated within the tub. Advantageously a heater heats an airflow into the tub and basket for drying following rinsing by rotating the basket in the airflow.

An equipment washing machine includes a frame, a tub rigidly mounted to the frame and cooperating with a supplier of washing fluid, rinsing fluid and drying air, and a porous basket rotatably mounted inside the tub. At least one porous sided equipment container is resiliently mountable into the basket. The equipment container is adapted for holding flexible articles including articles of apparel or other equipment or protective gear positioned for movement of the washing fluid, rinsing fluid and drying air therethrough and releasably mounted substantially stationary relative to the container as the basket is rotated relative to the tub with the container mounted in the basket. The water supply cooperates with the tub for washing and rinsing the articles held in the container while the basket is being rotated or agitated within the tub. Advantageously a heater heats the drying air to provide a hot airflow into the tub and basket for drying by rotating the basket in the airflow.

In summary, the equipment washing machine according to the present invention includes a frame, a tub rigidly mounted to the frame, a supply means for supplying washing fluid, rinsing fluid and drying air cooperating with the tub. A porous basket is rotatably mounted inside the tub. The basket is selectively rotatable by selective rotation means. At least one porous-sided equipment container is releasably mountable into the basket. Each equipment container is adapted for holding flexible articles positioned within the container, by means for securing the articles, for flow of the washing and rinsing fluids and drying air therethrough. The means for securing the articles hold the flexible articles mounted to and substantially separated from each other, and stationary relative to the container as the basket is rotated relative to the tub in the sequential presence of the washing fluid, the rinsing fluid, and the drying air.

In one embodiment, each equipment container may be a clam-shell container. The clam-shell container may include two half-containers hinged contiguously along a common side edge, common between the two half-containers.

The basket may have a cylindrical wall and each equipment container may be mountable into the basket so as to dispose the common side edge along and adjacent the cylindrical wall of the basket with the two half-containers diverging from the common side edge so to dispose the two half-containers adjacent the cylindrical wall. Each half-container  
5 may be in cross section orthogonal to the common side, a segment of a circle so as to be generally quonset-shaped when containing the articles. Thus, a flexible sided half-container may take on the quonset-shape once filled with articles to be washed.

A curved surface of each half-container, corresponding to an arc bounded by a  
10 chord of the segment of a circle, may be substantially conformal to an inside surface of the cylindrical wall when the container is mounted in the basket and the container contains articles to be washed where the half-container is soft-sided, a flat surface of the half-container, corresponding to the chord bounding the arc in the segment of a circle, may include a rigid  
15 perimeter frame to support the otherwise soft flexible container. A flexible porous material may be mounted to the frame so as to form the flat surface. The curved surface may also be made of the flexible porous material.

In a further embodiment, the half-container may be made of rigid porous material. The rigid porous material may be mounted on a rigid frame, and the rigid frame may  
20 define the quonset shape.

The curved surface of the container may have a releasably closable door or flap or closure (collectively claimed as a door herein) for selective access into the container when the container is removed from the basket.

25 The clam-shell container may have a vertice bisecting two clam-shell halves comprising the clam-shell container. Where the basket is a cylinder having an axis of symmetry, a plurality of container supports may be mounted in the cylinder for holding the clam-shell container in the cylinder with the vertice adjacent a wall of the cylinder and parallel

to the axis of symmetry of the cylinder. The container supports may include rigid members extending parallel to the axis of symmetry. The container supports may maintain the clam-shell halves adjacent the wall. The clam-shell container may be mountable into the basket by, for example, sliding the clam-shell halves and the vertice along the rigid members in a direction parallel to the axis of symmetry.

In a further alternative embodiment, not intended to be limiting, each container may be a single generally quonset-shaped container in which case the basket may be compartmentalized to accept the container in a snug sliding fitment into a mating compartment in the basket so as to dispose the container adjacent an outer wall of the basket. If the basket is a cylinder, the compartment may dispose a curved surface of the container adjacent the outer wall.

The basket may have a plurality of compartments for holding a corresponding plurality of the containers. The compartments may be radially spaced about the axis of symmetry, around the outer wall.

#### Brief Description of the Drawings

Figure 1 is, in partially cut away plan view, the equipment washer according to one embodiment of the present invention.

Figure 2 is a schematic sectional view along line 2-2 of the equipment washer of Figure 1.

Figure 3 is an isometric view, partially cut away, of the equipment washer of Figure 1.

Figure 3a is an isometric view of one embodiment of an equipment container.

Figure 4 is a plan view of a further embodiment of the equipment washer according to the present invention.

5

Figure 5 is a partially cutaway isometric view of the washer of Figure 4.

Figure 6 is a partially exploded isometric view of the washer of Figure 4 showing the equipment container removed.

10

Figure 7 is a plan view of an alternative embodiment of the equipment washer according to the present invention.

Figure 8 is a partially exploded partially cut away isometric view of the equipment washer of Figure 7.

15

Figure 9 is an isometric view of one rigid-frame equipment container of Figure 8 with one side opened to receive articles of equipment.

Figure 10 is a plan view of a further alternative embodiment of the equipment washer of the present invention.

20

Figure 11 is an isometric view of one rigid-frame equipment container of Figure 10.

25

#### Detailed Description of Embodiments of the Invention

With reference to the drawing figures, wherein similar characters of reference denote corresponding parts in each view, a typical washing machine 10 has an exterior frame

12, a watertight tub 14 rigidly mounted to frame 12, and a basket 16 rotatably mounted inside tub 14. Tub 14 is closable by a lid 18. Washing machine 10 may be agitated by a motor 20 about axis A, which may be positioned either vertically as illustrated or horizontally as found in my presently pending United States Application No. 10/098,466 and seen in my issued  
5 United States Patent No. 6,374,644, both of which incorporated herein by reference.

Basket 16, as may be seen in Figure 3, is provided with elongated clips such as channels 22a and 22b which are mounted vertically to the inside surface of basket 16 and extend generally parallel to axis A.

10 Mesh equipment container 30 which may in one embodiment be in the nature of a garment bag, is provided for securely holding the articles of sporting equipment. Advantageously the bag will hold all of the equipment for a single player. Container 30 is placed in basket 16. The use of container 30 may prevent sporting equipment from becoming  
15 intermingled or lost. Container 30 may be readily and efficiently loaded with garments or other equipment and then placed into basket 16. An equipment container 30 for articles of apparel or protective gear for a hockey player, for example, will of necessity be quite large. Figures 1-3 illustrate a washing machine compatible for a single equipment container 30, Figure 3a illustrating an example of a container 30.

20 Equipment container 30 may, as illustrated, take the form of a garment bag having mesh construction, mounted on a first side 32 of which to, so as to extend across, rigid, opposed facing, generally rectangular, perimeter stiffeners 34a and 34b pivotally mounted or hinged to one another, for example by rings 36 along their sides 38. The second side 40 of  
25 mesh bag 30 defines a voluminous interior cavity between it and first sides 32. Second side 40 has a perimeter edge which extends contiguously around the perimeter edge of first side 32 second side 40 may be conformably curved so as to conform to the shape of equipment to be immovably held within container 30. The voluminous interior cavity is shown by way of example as side compartments 42 formed intermediately of first side 32 and second side 40.



The side compartments are readily accessible through flexible hatches or flaps 44 or the like which may be releasably closed by means of fasteners known in the art such as zippers or strips of hook and loop fasteners or the like. Flaps 44 close corresponding openings which are conveniently large. Flaps 44 may be opened to access the interior cavities of side compartments 42.

Side compartments 42 may themselves be further compartmentalized to accommodate specific articles of equipment such as sports equipment (not shown). When such equipment has been inserted into compartments 42, and flaps 44 closed and fastened, the mesh equipment container 30 may then be placed into a basket 16 where the container is designed for a particular application so that the number of compartments matches the number of separate items to be washed for that application, loading of a transport using the container reduces the worry that a piece of equipment has either been left out or may be left behind. Container 30 when gripped medially of the long sides of stiffeners 34, for example sides 38b, may then be elevated above tub 14. By slightly unhinging, that is, angularly separating stiffeners 34a and 34b, the distal ends 39 of the stiffeners may be brought into vertical alignment with channels 22a secured to the inside surface of basket 16, and sides 38 may vertically align with channels 22b so that container 30 may be dropped into place inside basket 16.

As may be seen in Figures 4 through 6, basket 16 may be modified so as to be capable of accepting a plurality of containers 30 such as the two large mesh equipment containers 30 illustrated. Basket 16 is supported by upper and lower radial supports 48 and an axial spindle 50. Support channels 52 for equipment containers 30 are positioned radially of spindle 50 on the inner face of basket 16. In illustrated example, not intended to be limiting, each equipment container 30 is secured within basket 16 in a similar drop down manner to that illustrated in Figure 3.

As seen in Figure 4, plates 56 secured to each end of axial spindle 50 have indents 58. Indents 58 are aligned radially of spindle 50 with corresponding channels 52 on the inner face of basket 16. In that embodiment, when only a single equipment container 30 is utilized, baffle 60 may be inserted to equalize the rotational loading as basket 16 is agitated through washing fluid in tub 14.

Figures 7 through 9 depict a further variation wherein basket 16 is modified by internal baffles 64 placed medially within basket 16 so as to create between baffles 64 and basket 16 two outer compartments into which equipment containers 30 can be placed. In this aspect the containers 30 may preferably be rigid containers where the frame 70 is a rigid perimeter frame, as illustrated in Figure 9, with a open mesh covering, or alternatively container 30 may have a frame with perforated mesh like areas integrally moulded from rigid plastic or the like. Frame 70 has divergent generally rectangular bases 72 and 72a, which between them include an angle of generally 90 degrees. Side compartments 76, which may be further compartmentalized, are generally arcuate and comprise in section a circular segment whose radius permits ready insertion within a basket 16 of washer 10. Each compartment 76 is accessible by way of hatch 80, which is hinged to compartment 76 as at 82. Hatch 80 is securable in a closed position by means of spring latches 84 or the like.

As seen in Figures 10 and 11, side compartments 76 of equipment container 30, illustrated in Figure 9, may alternatively be designed as separate equipment containers 90. This design will permit up to four of such containers 90 to be inserted into a suitably compartmentalized washer.

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the object of immobilizing items of equipment in, and relative to, an equipment container, and rotating the entire equipment container within a bath of washing fluid prior to rinsing and spin drying.